Database Management: Normalization Exercise Suite

The ***Emergency Service & Product*** (ESP) Company is a very small parts and service company. It currently uses a crude paper based system (3 by 5 cards, paper journal, etc) to keep track of its customers, inventory, suppliers, payments and invoices.

The company is growing rapidly and has found that it is unable to keep pace with the volume of data it must record about its business activities. It has decided that it wishes to automate some portions of its business.

You have been hired to assist the company in analyzing its business activities and to design a set of relational tables that they can use to develop a database system.

The company will provide you with copies of all their paper based forms (invoices, orders, batch records, etc). You will use these over several weeks to analyze the various forms and produce **third normal form (3NF)** relational **entity relationship diagrams (ERD)** for each **view** of their data. As a last step in the process, you will **merge** all the views to produce **one integrated ERD** and **fully detailed relational entities.**

Customer Details View

ESP keeps detailed information about each customer so that they can be contacted when needed or when a product needs to be sent in the mail. This information is kept on 3x5 cards as it is fairly static in size and doesn't change very often. The cards look as follows:

Customer Details	**Customer Number: 137**
Name:	Fred Smith
Address:	123 SomeWhere St.
City:	Edmonton
Province:	Alberta
Postal Code:	T5H 2J9
Home Phone:	436 - 7867

Customer numbers are unique and are never reused by the company. A card is created for each new customer that buys from the company.

Customer Orders View

ESP has preprinted order forms that they fill in by hand when a customer buys some of their product. The customer details are copied from the customer card onto the order form as well as details about the product ordered. Each order form has a preprinted sequential order number that is unique. The top portion of the forms looks as follows:

Customer Name:
Address:

Phone:

Order Number: 219

Item Number	Description	Quantity	Price	Amount
H23	Heater Fan Belt – 23”	1	11.99	11.99
H319	Heater Fan Belt Support Brackets	2	4.99	9.98
M24	Bolts – 24 mm	8	0.29	2.32
			Subtotal:	24.29
			GST:	1.70
			Total:	25.99

The forms are two part with carbon in between. The customer gets the top copy and ESP keeps the other. The ESP copy is filed by order number into a binder.

Because prices change on a fairly regular basis ESP would like to keep the following information:

- The current price for each item in inventory
- The price each item sold for at the time the item was sold

You are to take the information provided above and prepare a set of 3NF relational entities and produce a relational 3NF ERD for each view. Merge the two view schemas to produce a single set of tables (conceptual level schema) that will
satisfy the requirements of both views.